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(1) EVIDENCE FOR A MULTIPHASE ISM IN EARLY TYPE GALAXIES

(2) ELLIPTICAL GALAXIES WITH STRONG RADIO CONTINUUM

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Principal Investigator
Dr. Dong Woo Kim

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Smithsonian Institution
Astrophysical Observatory
Cambridge, Massachusetts 02138

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The NASA Technical Officer for this grant is Dr. Robert Petre, Code 666, Laboratory for High Energy Astrophysics, Space Science Directorate, Goddard Space Flight Center, Greenbelt, Maryland 20771.

We present the results of a deep observation of NGC 507 and NGC 499 with the ROSAT PSPC. The X-ray emission of NGC 507 is extended at least out to 1000 arcsec (458 kpc at a distance of 94.5 Mpc). The radial profile of X-ray surface brightness goes as $\Sigma_X \sim r^{-1.8}$ outside the core region. The radial profile is a function of energy such that the softer X-rays have a smaller core radius and a flatter slope. Spectral analysis reveals that the emission temperature, with an average of 1 keV, peaks at an intermediate radius of 2-3 arcmin and falls toward the center (possibly decreases outward as well). The absorption column density is consistent with the Galactic line-of-sight value. The X-ray emission of NGC 499 is extended to 300 arcsec and suggests a similarly cooler core. The cooler cores of NGC 507 and NGC 499 are strong evidence of the presence of cooling flows in these galaxies. Assuming hydrostatic equilibrium outside the cooling radius, the estimated mass to light ratio of NGC 507 is 97 ± 16 within 458 kpc, indicative of the presence of a heavy halo. Similarly the mass to light ratio of NGC 499 is 89 ± 14 within 137 kpc. Near the edge of the X-ray emitting region of NGC 507 we detect 19 soft, unresolved sources. These sources do not have optical counterparts and are significantly in excess of the expected number of background serendipitous sources. We speculate that they may represent cooling clumps in the halo of NGC 507. If there are many undetected cooling clumps distributed at large radii, then the radial profile of the X-ray surface brightness does not directly reflect the potential, adding uncertainty to the measurement of the binding mass; the gas mass could also be overestimated.